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WARE FRESSOLA VAN DER SLUYS & ADOLPHSON, LLP
BRADFORD GREEN, BUILDING 5
755 MAIN STREET, P O BOX 224
MONROE, CT 06468

EXAMINER	
PEREZ, JULIO R	

ART UNIT	PAPER NUMBER
2617	

MAIL DATE	DELIVERY MODE
11/24/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/019,705	KALLIOJARVI, KARI	
	Examiner	Art Unit	
	JULIO PEREZ	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 July 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,6,9-11,13-15,19 and 22-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,6,9-11,13-15,19 and 22-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 07/24/2009 have been fully considered but they are not persuasive.

a) In response to the Applicant argument, on page 7, complete second paragraph, that Wylie fails to disclose to determine a characteristic parameter describing the line-of-sight conditions of the radio propagation environment of each antenna for two base stations, the characteristic parameter describes excess path lengths caused by obstacles in the environment by means of one of a number of discrete levels, and computing distances between the mobile station and the two base stations, and relies upon MacDonald for this teaching.

The Examiner respectfully disagrees, the combination of Wylie and MacDonald teach propagation loss model based on Hata model that includes propagation path slope within different propagation environment schemes, being urban, suburban or rural terrain. The propagation loss model, in turn, describes the propagation path, line of sight characteristics, of the terrain, thus, determining factors (levels; i.e., reads on discrete levels) for different type of terrain and building density, which form obstacles or blockage on the path of the signal (col. 6, lines 48-67; col. 7, lines 1-59). McDonald further calculating a location estimate of the mobile telephone with receiving a list of signal strengths received by the telephone from cell sites, i.e., base stations within a serving coverage area and hence calculating the distances between the mobile and a plurality of cell sites, which takes into account path lengths caused by obstacles (Figure

8; col. 6, lines 39-67, - col. 7, lines 1-15 of MacDonald). It should be noted that MacDonald has not been applied alone to meet the argued limitation. It is the combination of Wylie and MacDonald what meets the argued limitation.

b) In response to the Applicant's argument that MacDonald teaches a different system of determining location wherein the location, in the claim , is determined by travel time differences, whereas MacDonald uses signal strength measurements and not determining distance.

The Examiner respectfully disagrees. The combination of Wylie and MacDonald teachings on determining a range measurement, used as the distance, between the base station and mobile station, wherein the non line of sight ranging error, i.e., characteristic parameter, is corrected for the base stations, which are identified to be out of sight with relevant mobile stations, in which tests, the measurements may be reconstructed to obtain the line of sight measurements, thus reading on conditions of the parameters of line of sight, characteristic of LOS, as it is related to the environment on the radio propagation of the radio coverage; i.e., urban, suburban, or rural, which includes obstacles, which reads on "a characteristic parameter that describes excess path lengths caused by obstacles in the environment" and further that does provide computing the distance based on measurements based on time and characteristic parameter or time of arrival and characteristic parameter.

Furthermore, the base station can be determined to be at non-line of sight by studying the deviation standard measurement noise from the environment, i.e., characteristic parameters, to the standard deviation of smothered range measurements

obtained from rage measurements (which relates to distance) between the base station and mobile station, wherein the standard deviation of the smothered range being in the order of the SD of the standard measurement of noise, i.e., characteristic parameter, wherein the base station corresponds to an LOS environment; hence the mobile station location can be determined using range measurements between LOS base stations and the mobile itself or, as specified above, via reconstructed LOS range measurements, which, in turn, corresponds to characteristic parameters of the line of sight conditions.

Moreover, giving its broadest and reasonable interpretation, Wylie teaches the determining characteristic parameter, which is used for determining the location of the mobile station; thus, the standard deviation determination through environment propagation determination, provides means to acquire characteristic parameters that in turn provide conditions of the propagation environment such as urban, suburban, or rural depending on the terrain environment, and therefore the location of the mobile station (see col. 2, lines 35-67, - col. 3, lines 1-7; col. 4, lines 7-10).

c) In response to the Applicant's argument that "signals strengths" are no time measurements systems."

The Examiner respectfully disagrees. First of all, whether or not signal strengths being of time measurements systems or the discussion of the formula (see page 8, at the end of second paragraph) is neither a discussion of issue of the claim. However, the Examiner points out that "signal strengths" are RSSI determinations of equivalent accuracy and are obtained **per unit time**. Therefore, "signal strengths" are time-related, thus related to "time measurements."

d) In response to that "Accordingly, one of skill in the art would not be motivated to incorporate the teachings of MacDonald with Wylie in order to arrive at the limitations recited in the claims. Accordingly, for at least these reasons, claim 1 is not disclosed or suggested by the cited references," (page 8, fourth paragraph), the Examiner points out that based on signal strengths, which signal strengths are known to travel with time between mobile phones and cell sites or base stations, thus calculating the arrival of such signals at the stations based on time arrivals as well (col. 3, lines 23-53; Figure 8; col. 6, lines 37-67-col. 7, lines 1-15). Further, there is travel time shown in Wylie, col. 4, lines 7-22. Thus, it reads on the fact that there exists travel time of the waves, shown on the speed of the waves as related to time.

e) The Applicant has amended by inserting "at least" thus to read "at least" two base stations: the Examiner points out that MacDonald reference describes more that two bases stations, that is, it calculates the distance with at "at least" two base stations.

f) In addition, it should be noted that MacDonald has not been applied alone to meet the argued limitation. It is the combination of Wylie and MacDonald what meets the argued limitation.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 5-8, 10, 11, 13-15,19, 20, 22-31, are rejected under 35 U.S.C. 103(a) as being unpatentable over Wylie et al. (5,974,329) in view of MacDonald (5,732,354).

Regarding claims 1,15, 23, Wylie discloses a method (and arrangement and a location server) measuring at least one feature of a signal received from the transmitting station at the receiving station, said feature being such that it can be used for determination of the distance between the transmitting station and the receiving station (col. 2, lines 27-28; col. 3, lines 5-7; col. 4, lines 55-62; col. 4, lines 7-10, 39-65, the signal strength from the mobile station may be measured in relation to its position within the different coverage areas; furthermore, the range measurements correspond to power signal measurements); and computing the distance [i.e., range measurement] between the transmitting station and the receiving station using said measured signal feature [i.e., signal strength power] (col. 2, lines 64-67; col. 3, lines 1-16 and 55-65; col. 4, lines 39-67; col. 5, lines 1-4, 66-67-col. 6, lines 1-10, 26-31), determining the current geographical location of one of the transmitting stations (col. 3, lines 3-5); and wherein each base station comprises a plurality of antennas covering a sector of the base station (Figure 3, #'s 12, 13, strongly suggests the use of sector antennas on the base stations or cites).

What Wylie does not explicitly disclose is that the method is implemented in the system to store and determine a characteristic parameter describing the line-of-sight conditions of the radio propagation environment of each antenna for two base stations, wherein the characteristic parameter describes excess path lengths caused by

obstacles in the environment by means of one of a number of discrete levels; computing distances between the mobile station and the at least two base stations.

MacDonald teaches propagation loss model based on Hata model that includes propagation path slope within different propagation environment schemes, which in turn describe the propagation path, line of sight characteristics, of the terrain, thus, determining factors (levels) for different type of terrain and building density (col. 6, lines 48-67; col. 7, lines 1-59). McDonald further calculating a location estimate of the mobile telephone with receiving a list of signal strengths received by the telephone from cell sites, i.e., base stations within a serving coverage area and hence calculating the distances between the mobile and a plurality of cell sites (Figure 8; col. 6, lines 39-67, - col. 7, lines 1-15).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Wylie to include MacDonald as it is known to implement measurements systems with coefficient factors (levels) or correction factors and determine distances among base stations and the mobile station to provide a more accurate location of the mobile station.

Regarding claim 5, the combination discloses at least one feature comprises at least travel time of the signal between the mobile and base station (Wylie, col. 4, lines 7-10).

Regarding claim 6, the combination discloses at least one feature comprises at least signal travel time differences between the mobile station and base station (Wylie, col. 4, lines 7-10).

Regarding claim 7, the combination discloses at least one feature comprises at least strength of the signal transmitted between the mobile and base station (Wylie, col. 4, lines 7-10, 39-65).

Regarding claim 8, the combination discloses at least one feature comprises the quality of the signal transmitted between the mobile and base station (Wylie, col. 4, lines 7-10, 39-65).

Regarding claims 10, 19, the combination discloses defining propagation environments for several stations; and classifying the stations in different radio propagation environment classes; wherein the characteristic parameter is based on the class of the station (MacDonald, col. 7, lines 30-40).

Regarding claim 11, the combination discloses the characteristic parameter is stored and processed in a location service node implemented in the mobile telecommunications system (MacDonald, col. 7, lines 51-67).

Regarding claim 13, the combination discloses the determination of the characteristic parameter comprises steps of: determining the current geographical location of said mobile station in way that is external to the telecommunications system; and inputting the results of the determination to the telecommunications system (Wylie, col. 3, lines 5-7).

Regarding claim 14, the combination discloses comprising use of a satellite based positioning system said determining of the current geographical location of the mobile station (Wylie, col. 2, lines 64-67; col. 3, lines 1-16; col. 4, lines 39-67; col. 5, lines 1-4, 66-67-col. 6, lines 1-10, 26-31).

Regarding claim 20, the combination discloses wherein the feature of the signal is based on one or several of the following: travel time of the signal between the transmitting and receiving stations, signal travel time difference between the transmitting and receiving stations, the strength of the received signal, the quality of the received signal (Wylie, col. 2, lines 27-28; col. 3, lines 5-7; col. 4, lines 55-62; col. 4, lines 7-10).

Regarding claim 22, the combination discloses the mobile station comprising a sector antenna (Wylie, Figure1A-1B, and Figure 3, sites with three sector-antennas, #'s 12, and 13).

Regarding claim 24, Wylie discloses an arrangement comprising: a first station (col. 4, lines 7-10, 39-65; Figures 1A-1B); a second station for communicating by radio with the first station (col. 4, lines 7-10, 39-65; Figures 1A-1B); means for defining the current geographical location of the first station by means of a source of location information that is external to the telecommunications system (col. 2, lines 64-67; col. 3, lines 1-16; col. 4, lines 39-67; col. 5, lines 1-4, 66-67-col. 6, lines 1-10, 26-31; a GPS system provides location information to mobile and base stations as evidenced by the fact that GPS units, (and within base station transceivers), in a mobile system, are located within mobile stations for providing and facilitating their geographical positions as well as transmitting such positions to respective base stations); determining means for determining a feature of a radio signal received by one of the stations from the other stations (col. 2, lines 64-67; col. 3, lines 1-16; col. 4, lines 39-67; col. 5, lines 1-4, 66-67-

col. 6, lines 1-10, 26-31); each antenna covering a sector of the base station (Figure 3, strongly suggests the use of sector antennas on the base stations or cites).

What Wylie does not specifically disclose is that the method is implemented in the system to store and determine a characteristic parameter describing the line-of-sight conditions of the radio propagation environment of the base station, wherein the characteristic parameter describes excess path lengths caused by obstacles in the environment by means of one of a number of discrete levels; computing distances between the mobile station and the at least two mobile stations.

MacDonald teaches propagation loss model based on Hata model that includes propagation path slope within different propagation environment schemes, which in turn describe the propagation path, line of sight characteristics, of the terrain, thus, determining factors (levels) for different type of terrain and building density (col. 6, lines 48-67; col. 7, lines 1-59). McDonald further calculating a location estimate of the mobile telephone with receiving a list of signal strengths received by the telephone from cell sites, i.e., base stations within a serving coverage area and hence calculating the distances between the mobile and a plurality of cell sites (Figure 8; col. 6, lines 39-67, - col. 7, lines 1-15).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Wylie to include MacDonald as it is known to implement measurements systems with coefficient factors (levels) or correction factors and determine distances among base stations and the mobile station to provide a more accurate location of the mobile station.

Regarding claim 25, the combination discloses comprising means for receiving signals from a satellite based positioning system (Wylie, col. 2, lines 64-67; col. 3, lines 1-16; col. 4, lines 39-67; col. 5, lines 1-4, 66-67-col. 6, lines 1-10, 26-31).

Regarding claim 26, the combination discloses comprising means for determining if an update of the data concerning the radio propagation environment is required (MacDonald, col. 7, lines 5-40).

Regarding claim 27, the combination discloses wherein the first station comprises a portable device (Wylie, col. 2, lines 64-67; col. 3, lines 1-16; col. 4, lines 7-10, 39-67).

Regarding claims 28, 30,, the combination discloses the signal is transmitted from the at least two base stations to the mobile station and the signal is measured at the mobile station (MacDonald, Figure 8, col. 6, lines 39-51).

Regarding claims 29, 31, the combination discloses the signal is transmitted from the at least two base stations to the mobile station and the signal is measured at the at least two base stations (MacDonald, Figure 8, col. 6, lines 39-51, base stations provider means for signal measurements).

4. Claim 9, is rejected under 35 U.S.C. 103(a) as being unpatentable over Wylie in view of MacDonald and Hilsenrath et al., 6,026,304 (hereinafter Hilsenrath).

Regarding claim 9, Wylie in view of Sheynblat and MacDonald does not explicitly disclose, comprising use of a weighted least square method for the determination of distances between the receiving and transmitting stations, wherein the used weighting matrix is the inverse of an error covariance matrix.

However, in a similar field of endeavor, Hilsenrath discloses a method and apparatus in a wireless communication system that accurately determines the transmitter's location (col. 6, lines 6-34-col. 7, lines 9-35-col. 8, lines 15-53).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination with the teachings of Hilsenrath for the purpose of having an entity that would efficiently and accurately locate the mobile station in a coverage area.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JULIO PEREZ whose telephone number is (571)272-7846. The examiner can normally be reached on 10-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, PATRICK EDOUARD can be reached on (571)272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

11/9/2009

/J. P./
Examiner, Art Unit 2617

/Patrick N. Edouard/
Supervisory Patent Examiner, Art Unit 2617